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10/539,243	07/29/2005	Yuichi Takai	112857-463	9242
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K&L Gates LLP				
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CHICAGO, IL 60690				
EXAMINER				
HAN, KWANG S				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Office Action Summary

Application No.

10/539,243

Applicant(s)

TAKAI, YUICHI

Examiner

Kwang Han

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/22)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

**A COMPACT FUEL CELL SEPARATOR INCORPORATING FLUID OXIDANT SUPPLY
MEANS, A FUEL CELL DEVICE AND AN ELECTRONIC APPLIED DEVICE
INCORPORATING THE COMPACT FUEL CELL SEPARATOR**

Examiner: K. Han SN: 10/539,243 Art Unit: 1795 February 1, 2010

Detailed Action

1. The Applicant's amendment filed on October 20, 2009 was received. Claims 13 and 23-24 were amended.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

3. The objection to the specification has been withdrawn in view of the Applicant's amendment to the title.

Claim Rejections - 35 USC § 103

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. (JP 07-249419, machine translation) in view of Kobayashi (US 5258239) is maintained.

Regarding claims 13, Goto is directed towards a fuel cell (examples include phosphoric acid or solid oxide type which inherently include an MEA adapted to receive hydrogen gas as a fuel [0003]) separator comprised of the following:

- a separator body adapted to contact with a generating element (2, 3) creating a generating cell [0041, 0042],

- grooves (60, supply channel) formed on separator body (1), and
- flow quantity control valves (59, fluid oxidant supplying means) provided for each channel within the separator body for supplying fluid oxidant into the fluid oxidant channel (Drawings 2 and 3) [0024].

Goto is silent towards the fluid oxidant supplying means comprises at least one element selected from the group consisting of a fan and a pump.

Goto and Kobayashi are analogous art because both deal with the same problem solving area of providing fluid flow through a fuel cell device. To one of ordinary skill in the art a metal-air cell is a type of fuel cell.

Kobayashi teaches the use of a diaphragm pump (Figure 2B) in a metal-air cell to provide air flow which is integrated within the cell casing (1) at the air intake port which forms the air flow channel (2) to provide air supply control and enhance the electrical characteristics of the cell (2:14-18). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Kobayashi's diaphragm pump in place of the flow control valves in Goto's separator channels because Kobayashi teaches that this pump is a device placed in the air flow channel which can provide air supply control and enhance the electrical characteristics of the cell.

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art. (MPEP 2143)

Regarding claim 14, Goto et al. discloses a groove (60) having an opening exposed to one end of the separator body (Drawing 4) and a fluid flow quantity control valve (59) provided at the opening to provide a flow of fluid oxidant in the supply channel (Drawing 4) [Abstract].

Regarding claim 15, Goto et al. is directed towards grooves comprising a plurality of channels formed on the separator body (Drawing 4) and each of the channels have an opening with a plurality of supplying means provided at the openings of the channels to individually make a flow of the fluid oxidant in the channels [Abstract].

Regarding claim 16, Goto et al. is further directed towards a separator with a plurality of groups of adjacent channels (60) with each group of adjacent channels having an opening (Drawing 5) and a fluid oxidant supplying means (59) provided at the opening of the groups of the adjacent channels.

Regarding claim 21, the Applicant is directed towards the discussion for claim 13 above.

Regarding claim 23, the teachings of Goto et al. as discussed above are herein incorporated. Goto et al. is further directed towards a fuel cell body formed by stacking a plurality of generating cells with a pair of separators [0040] (Drawing 2).

5. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. and Kobayashi as applied to claim 13 and 14 above, and further in view of Shiue et al. (US 6500575) is maintained.

Regarding claims 17-20 the teachings of Goto as discussed above are herein incorporated. Goto et al. discloses a flow quantity control valve (59, 69) having a fin to be oscillated (Drawing 3) to provide a flow of said fluid oxidant and an actuator (bimetal) [0018, 0020] comprised of a shape memory alloys [0020] with different coefficients of thermal expansion [0045] for driving the fin but is silent towards the fluid oxidant supply means being a fan.

Shiue teaches the use of a micro fan in a zinc-air cell to control air flow between air pathways [Abstract] which are fabricated with an actuator comprising a piezoelectric (Column 5, Lines 20-46) for the benefit of providing air draft in the cell used to generate electricity. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Shiue's micro fan as the fluid oxidant supply means in Goto's fuel cell because Shiue teaches it as a means to provide greater air draft.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. and Kobayashi as applied to claim 14 above, and further in view of Shiue et al. (US 6500575) and Khandkar et al. (US 5856035) is maintained.

The teachings of Goto et al. and Kobayashi as discussed above are herein incorporated. Goto further discloses the fluid oxidant channels to be formed inside of the separator body, extending along the surface (Drawings 5, 6), but is silent towards the opening elongated in the transverse direction and the fluid oxidant supply means comprising a rotary fan.

Khandkar teaches the use of a separator (44) which includes a trough structure (40, Figure 1) having an elongated opening for the benefit of providing cavities for fuel or air flow (Column 6, Lines 17-25; Figure 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Khandkar's elongated opening within the separator structure of Goto and Kobayashi's fuel cell because Khandkar teaches this structure provides for a larger cavity to increase fuel and air flow.

Shiue et al. teaches the use of a micro rotary fan (Column 5, Lines 38-41) in a zinc-air cell to control air flow between separators [Abstract] for the benefit of providing air draft in the cell. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Shiue's micro rotary fan in Goto's separator modified by Khandkar's elongated opening because Shiue teaches it as a device which provides the maximum air draft.

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. in view of Kobayashi and further in view of Pratt et al. (US 6127058) is maintained.

The teachings of Goto et al. and Kobayashi as discussed above are herein incorporated. The applicant is directed towards the discussion concerning claim 13 above. Goto is silent towards an electronic applied device comprising a board wherein pluralities of fuel cell bodies are provided.

Pratt teaches a planar fuel cell where a plurality of fuel cell bodies (Figure 2; Column 4, Lines 31-38) are connected with each other on a board (24, frame) for the benefit of minimizing seals, piping, and electrical interconnections. It would have been

obvious to one of ordinary skill in the art at the time of the invention to apply Pratt's planar fuel cell arrangement in Goto and Kobayashi's fuel cell because Pratt teaches it minimizes the fuel cell profile and use of seals, piping and electrical interconnections.

Response to Arguments

8. Applicant's arguments filed October 20, 2009 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a) the Goto and Kobayashi references fail to disclose or suggest the fluid oxidant supplying means to be provided within said separator body for supplying the fluid oxidant,

(b) the flow control valves of Goto are fluid oxidant regulating means and not fluid oxidant supplying means with a separate air supply pump,

(c) the Kobayashi reference shows the diaphragm pump is provided within the cell casing and not within the separator body.

In response to Applicant's arguments, please consider the following comments:

(a) as discussed in the rejection above, the Goto reference teaches the flow control valves to be placed within the channels of the separator. Applicant's disclosure within figures 1A-4B of the specification shows the placement of the fluid oxidant supplying means to be within the channels to provide a fluid oxidant supplying means within a separator body,

(b) the limitations of a "fluid oxidant supplying means" can be interpreted as any apparatus or structure which allows for the oxidant to be supplied to the channels of the separator. The flow control valves clearly supplies oxidant to the channels by opening and closing the pathways for the oxidant to flow. It is acknowledged that Goto teaches a separate pump in addition to the control valves, however this does not negate the interpretation of the valves to be an oxidant supplying means for the separator,

(c) the Applicant's separator body provides the channels by which oxidant gas is provided to the generating element with the oxidant supply means provided at the inlet point of the channel. Kobayashi teaches the use of a diaphragm pump which is placed in the inlet region of the air inflow channel of the fuel cell (Figure 1). Goto also teaches the placement of the flow control device at the ends of each channel within the separator. Goto modified by the teachings of Kobayashi makes obvious the use of a diaphragm pump in the inlet region of a gas flow channel in place of the control valves because Kobayashi teaches the pump can provide air supply control and enhance the electrical characteristics of the cell as discussed above.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795